BUTYL ACRYLATE

CAS Registry Numbers: 141-32-2 $CH_2=CHCOOC_4H_9$

Molecular Formula: $C_7H_{12}O_2$

Butyl acrylate is a colorless liquid and a water-white, extremely reactive monomer. It is flammable and incompatible with oxidizing materials (Sax, 1989). It has a sharp, fragrant odor and is soluble in water, ethanol, ether, and acetone. Butyl acrylate is a polymerized ester (HSDB, 1993). It polymerizes readily on heating (Merck, 1989).

Physical Properties of Butyl Acrylate

Synonyms: butyl-2-propenoate; n-butyl acrylate; 2-propenoic acid; butyl ester; Lucite; Plexiglas; Perspex

Molecular Weight:	128.19
Boiling Point:	145 °C
Melting Point:	-64.6 °C
Flash Point:	120 °F (open cup)
Vapor Pressure:	4.9 mm Hg at 20 °C
Vapor Density:	4.8 (air = 1)
Density/Specific Gravity:	0.8898 at 20/4 °C (water = 1)
Log/Octanol Water Partition Coefficient:	2.36
Conversion Factor:	1 ppm = 5.24 mg/m^3

(HSDB, 1993; Sax, 1989)

SOURCES AND EMISSIONS

A. Sources

Butyl acrylate is used in the manufacture of polymers and resins for textile and leather finishes, paint formulations, solvent coatings, adhesives, binders, and emulsifiers. It is also used as a monomer for emulsion polymers and solution polymers, as a comonomer for acrylic fibers, and as an intermediate in organic synthesis (HSDB, 1993).

The primary sources of butyl acrylate emissions reported in the United States Environmental Protection Agency's (U.S. EPA) 1995 Toxics Release Inventory (TRI) Public Data Release

Report were the chemical and allied products industries (U.S. EPA, 1996b).

B. Emissions

Approximately 2,000 pounds of butyl acrylate emissions in California were reported in the U.S. EPA 1995 TRI Public Data Release Report (U.S. EPA, 1996b).

C. Natural Occurrence

No information about the natural occurrence of butyl acrylate was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient concentrations of butyl acrylate.

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations of butyl acrylate was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Butyl acrylate will be prone to photooxidation through its reaction with photochemically produced hydroxyl (OH) radicals. Based on the estimated rate constant for gas-phase reaction with the OH radical (Kwok and Atkinson, 1995), the calculated half-life and lifetime of butyl acrylate due to reaction with the OH radical are about 0.9 days and 1.3 days, respectively (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Butyl acrylate emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to butyl acrylate are inhalation, ingestion, and dermal

contact.

Non-Cancer: Exposures to butyl acrylate have caused eye and throat irritation, salivation, and lung irritation and edema. Repeated exposures may cause adverse effects on the lungs, liver, and kidneys. Direct skin or eye contact may result in irritation or tissue damage (HSDB, 1995). The U.S. EPA has not developed a Reference Concentration (RfC) or an oral Reference Dose (RfD) for butyl acrylate (U.S. EPA, 1995a).

Cancer: A single chronic inhalation study of rats exposed to butyl acrylate found no dose-related increase in tumors (Reininghaus et al., 1991). The U.S. EPA has not classified butyl acrylate for carcinogenicity (U.S. EPA, 1995a). The International Agency for Research on Cancer (IARC) has classified butyl acrylate in Group 3: Not classifiable as to its carcinogenicity to humans due to a lack of human evidence and inadequate animal evidence (HSDB, 1995).